

Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A workpiece inspection system comprising a machine tool which has a controller operable to perform a workpiece producing process and a workpiece inspection ~~process,~~ process on a workpiece, the workpiece inspection process being performed while a workpiece measurement device is mounted on the machine tool, the system operable to perform ~~comprising~~ the steps of:

~~mounting a workpiece measurement device on the machine tool;~~

changing ~~the position~~ a position of the workpiece relative to the workpiece measurement device;

issuing time-based ~~time-based~~ synchronisation signals defining a plurality of instants;

causing measurements of the workpiece to be recorded, the inspection system comprising which in particular involves:

a first system recording a first data set ~~from at least one first sensor comprising~~ varying data representing ~~the position~~ a position of the workpiece measurement device; and

a second system, independent to the first system, recording a second data set from the workpiece measurement device ~~at least one second sensor separate from the at least one first sensor~~ comprising varying measurement data concerning the workpiece as detected and output by the workpiece measurement device,

_____ wherein the time-based synchronisation signals are used by the first and second systems in the recording of the first and second data sets such that simultaneous measurement device position and workpiece measurement device measurement data can be determined and subsequently combined; and

combining data from the first and second data sets based on the synchronisation signals so as to obtain at least one instance of simultaneous measurement device position and workpiece measurement device measurement data so as to obtain a measurement at a location on the workpiece; and,

wherein, subsequent to said recording of the measurements of the workpiece, using the measurement obtained from the combined data is used to refine the workpiece producing process; process and the refined workpiece producing process is then performed.

2. (Currently Amended) A workpiece inspection system as claimed in claim 1 wherein the synchronisation ~~signal-issues~~signals issue from the controller.

3. (Previously Presented) A workpiece inspection system as claimed in claim 1 in which the synchronisation signals are used to label at least some of the recorded measurement device position data and/or workpiece measurement device measurement data in the first and second data sets such that simultaneous measurement device position data and workpiece measurement device measurement data can be determined and subsequently combined.

4. (Previously Presented) A workpiece inspection system as claimed in claim 1 wherein the measurement device is monitored at intervals which are more frequent than the occurrences of the said instants and only selected data is recorded to the second set and/or the data is manipulated prior to its recording.

5. (Canceled)

6. (Previously Presented) A workpiece inspection system as claimed in claim 1 wherein the system further includes an interface circuit which accepts the synchronisation signals and the varying data from the workpiece measurement device.

7. (Previously Presented) A workpiece inspection system as claimed in claim 1 wherein the system includes a stop signal path from the workpiece measurement device to a

machine controller and the machine controller can be configured to stop the workpiece measurement device if a stop signal is received by the machine controller.

8. (Original) A workpiece inspection system as claimed in claim 1 wherein the measurement device is a contact type dimensional measurement probe and the varying data relates to changes in the deflection of a workpiece contact stylus connected to the probe.

9. (Currently Amended) A workpiece inspection system as claimed in ~~claim 5~~claim 1 wherein the first set of data is corrected to at least reduce positional errors of the machine tool, prior to combination with the second set.

10. (Previously Presented) A workpiece inspection system as claimed in claim 1 wherein the first and/or second sets of data are manipulated such that the manipulated data represents approximately the data which would have been obtained had the elements of two sets been recorded simultaneously.

11. (Original) A workpiece inspection system as claimed in claim 1 wherein the controller issues a further signal which enables the recording of the second set.

12. (Canceled)

13. (Currently Amended) A workpiece inspection system comprising a machine tool having a first part, a second part movable relative to the first part, and a controller operable to perform both a workpiece production process and a workpiece inspection process on a workpiece and for producing varying data representing ~~the relative~~ a relative position of the first and second parts, the system also comprising ~~also~~ a workpiece measurement device attached to the ~~second machine~~ second part for producing varying measurement data and a synchronisation signal producer, the system ~~being operable such that~~ to perform the following workpiece inspection steps ~~are performed~~:

~~mounting the workpiece measurement device on the second part of the machine tool;~~

changing ~~the position~~ a position of the workpiece relative to the workpiece measurement device;

issuing time-based synchronisation signals defining a plurality of instants;

causing measurements of the workpiece to be recorded, the inspection system comprising which in particular involves:

a first system recording a first data set ~~from at least one first sensor~~ comprising varying machine position data representing ~~the position~~ a position of the workpiece measurement device mounted on the second part;

a second system, independent to the first system, recording a second data set from ~~at least one second sensor separate from the at least one first sensor~~ the workpiece measurement device comprising varying workpiece measurement device measurement data concerning the workpiece as detected and output by the workpiece measurement device, _____ wherein the time-based synchronisation signals are used by the first and second systems in the recording of the first and second data sets such that simultaneous machine position data and workpiece measurement device measurement data can be determined and subsequently combined; and

combining data from the first and second data sets based on the synchronisation signals so as to obtain at least one instance of simultaneous measurement device position and workpiece measurement device measurement data so as to obtain a measurement at a location on the workpiece; and,

wherein, subsequent to said recording of the measurements of the workpiece, using the measurement obtained from the combined data is used to refine the workpiece producing process and the refined workpiece producing process is then performed.

14. (Currently Amended) A workpiece inspection system as claimed in ~~claim~~ claim 13, wherein the system further includes software for influencing the workpiece

producing process performed at the controller of the machine tool on the basis of the combined data.

15. (Currently Amended) A workpiece inspection system as claimed in claim 1, wherein the second data set includes varying measurement data concerning the workpiece as detected ~~varying workpiece interaction data~~ from the workpiece measurement device.

16. (Previously Presented) A workpiece inspection system as claimed in claim 1, wherein the second data set represents deflection of the workpiece measurement device.

17. (New) A workpiece inspection system as claimed in claim 1, wherein the first data set represents 3-dimensional position of the workpiece measurement device, and the second data set represents deflection of the workpiece measurement device.

18. (New) A workpiece inspection system as claimed in claim 17, wherein the system generates a combined data set that includes a time-series of the deflection and a time series of the 3-dimensional position, the time series of the 3-dimensional position being combined and synchronized with the time series of the deflection.

19. (New) A computer-readable storage medium having computer-executable instructions embedded thereon for controlling a workpiece inspection system, the system comprising a machine tool which has a controller operable to perform a workpiece producing process and a workpiece inspection process on a workpiece, the workpiece inspection process being performed while a workpiece measurement device is mounted on the machine tool, the instructions instructing the system to perform the steps of:

changing a position of the workpiece relative to the workpiece measurement device;

issuing time-based synchronisation signals defining a plurality of instants;

causing measurements of the workpiece to be recorded by:

causing a first system of the inspection system to record a first data set comprising varying data representing a position of the workpiece measurement device; and

causing a second system of the inspection system, independent to the first system, to record a second data set from the workpiece measurement device comprising varying measurement data concerning the workpiece as detected and output by the workpiece measurement device,

wherein the time-based synchronisation signals are used by the first and second systems in the recording of the first and second data sets such that simultaneous measurement device position and workpiece measurement device measurement data can be determined and subsequently combined; and

combining data from the first and second data sets based on the synchronisation signals so as to obtain at least one instance of simultaneous measurement device position and workpiece measurement device measurement data so as to obtain a measurement at a location on the workpiece,

wherein, subsequent to said recording of the measurements of the workpiece, the measurement obtained from the combined data is used to refine the workpiece producing process and the refined workpiece producing process is then performed.